

# INTERNATIONAL STANDARD

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**Coaxial communication cables –  
Part 8-1: Blank detail specification for semi-flexible cables with fluoropolymer  
dielectric**





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IEC Secretariat  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**COAXIAL COMMUNICATION CABLES –****Part 8-1: Blank detail specification for semi-flexible cables  
with fluoropolymer dielectric**

## FOREWORD

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IEC 61196-8-1 has been prepared by subcommittee 46A: Coaxial cables, of IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories. It is an International Standard.

This second edition cancels and replaces the first edition published in 2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) title changed to "Coaxial communication cables – Part 8: Blank detail specification for semi-flexible cables with fluoropolymer dielectric";

- b) new requirements added in Clause 7;
- c) "mean characteristic impedance" (see IEC 61196-8:2012, 7.1.5) changed to "Characteristic impedance";
- d) Subclause 7.1.6 (see IEC 61196-8:2012) deleted.

The text of this International Standard is based on the following documents:

Draft	Report on voting
46A/1640/FDIS	46A/1646/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

This document is to be read in conjunction with IEC 61196-1:2005 and IEC 61196-8:2023.

A list of all parts in the IEC 61196 series, published under the general title *Coaxial communication cables*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## COAXIAL COMMUNICATION CABLES –

### Part 8-1: Blank detail specification for semi-flexible cables with fluoropolymer dielectric

#### 1 Scope

This part of IEC 61196 applies to coaxial communication cables described in IEC 61196-8. It specifies the requirements of semi-flexible coaxial communication cables with fluoropolymer dielectric and tin soaked copper wire braid outer conductor. These cables are intended for use in mobile communication base station antenna systems, terrestrial microwave communication, radar systems and wireless equipment or other signal transmission equipment or units.

This document determines the layout and style for detail specifications. Detail specifications (DS) can be prepared by a national organization, a manufacturer or a user by entering the details in the blank detail specification.

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61169-4, *Radio-frequency connectors – Part 4: RF coaxial connectors with inner diameter of outer conductor 16 mm (0,63 in) with screw lock – Characteristic impedance 50 Ω (type 7-16)*

IEC 61196-1:2005, *Coaxial communication cables – Part 1: Generic specification – General, definitions and requirements*

IEC 61196-8:2023, *Coaxial communication cables – Part 8: Sectional specification for semi-flexible cables with fluoropolymer dielectric*

IEC 61196-10:2022, *Coaxial communication cables – Part 10: Sectional specification for semi-rigid cables with fluoropolymer dielectric*

#### 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### **4 Guidance for the preparation of detail specifications**

The detail specification shall be written in accordance with the layout of the blank detail specification, which forms part of this document.

When a characteristic does not apply, then NA (not applicable) should be entered in the appropriate space.

When a characteristic applies but a specific value is not considered necessary, then NS (not specified) should be entered in the appropriate space.

The numbers shown in brackets in this and the following pages correspond to the following items of required information, which should be entered in the space provided.

- [1] Name and address of the organization that has prepared the document.
- [2] IEC document number and date of issue.
- [3] Address of the organization from which the document is available.
- [4] Related documents.
- [5] Any other references to the cable, national reference, trade name, etc.
- [6] Complete description of the cable.
- [7] Cable construction.
- [8] Engineering information.
- [9] Parameter or characteristic.
- [10] Reference to the relevant subclause of the sectional specification.
- [11] Minimum requirements; the values entered shall meet as a minimum the requirements of the sectional specification.
- [12] Remarks.



## 5 Detail specification

<b>Title:</b>	
<b>[1] Prepared by:</b>	<b>[2] Document No.:</b> <b>Issue:</b> <b>Date:</b>
<b>[3] Available from:</b>	<b>[4] Generic specification</b> <b>IEC 61196-1</b> <b>Sectional specification</b> <b>IEC 61196-8</b>
<b>[5] Additional references:</b>	
<b>[6] Cable description:</b> a) Cable variant b) Material of inner conductor c) Material and construction of dielectric d) Outer conductor e) Material of sheath (if any)	
<b>[7] Cable construction</b> <b>a) Inner conductor</b> Material: Diameter (mm) nominal: Tolerance (mm): ± ... <b>b) Dielectric</b> Material: Construction: Diameter (mm) nominal: Tolerance (mm): ±... <b>c) Outer conductor</b> Material: Construction: Diameter (mm) nominal: Tolerance (mm): ±... <b>d) Sheath (if any)</b> Material: Minimum thickness (mm): Diameter (mm) nominal: Tolerance (mm): ± ...	
<b>[8] Engineering information (reference only)</b> a) Operation, storage and installation temperature range: b) Maximum recommended operating frequency, cut-off frequency: c) Nominal characteristic impedance: d) Relative propagation velocity (velocity ratio): e) Maximum continue working voltage: f) Minimum bending radius (static state): g) Minimum bending radius (dynamic state): h) Nominal weight: i) Capacitance: j) Maximum tensile force (when required): k) Average power (when required): l) Peak power (when required):	

[9] Parameter	[10] IEC 61196-8:2023 Subclause	[11] Value	[12] Remarks
<b>Electrical characteristics</b>	7.2		
Continuity	7.2.1	Inner conductor shall be continuous. Outer conductor shall be continuous.	
Conductor direct current resistance	7.2.2	≤ ... Ω/km (inner conductor) ≤ ... /km (outer conductor)	
Capacitance	7.2.3	≤ ... pF/m	
Withstand voltage of dielectric	7.2.4	... kV RMS	40 Hz ~ 60 Hz
Withstand voltage of sheath (or spark test) <sup>a</sup>	7.2.5	... kV RMS	40 Hz ~ 60 Hz
Characteristic impedance	7.2.6	(…±…) Ω	
Insulation resistance	7.2.7	≥ 10 <sup>4</sup> MΩ·km	
Propagation velocity <sup>b</sup>	7.2.8	≥ ...% or ...% ±...%	
Return loss	7.2.9	...MHz to MHz ≥ ...dB	Sample length: ≥ 2 m
Attenuation constant	7.2.10	... MHz ≤... dB/m at 20 °C	
Passive intermodulation <sup>b c</sup>	7.2.11	Better than –158 dBc	This test is only applicable to cables with characteristic impedance of 50 Ω. Both ends of the sample should be attached with type 7-16 connectors (according to IEC 61169-4). Input power: 2×20 W Test frequency: ...MHz
Screening attenuation <sup>b</sup>	7.2.12	Better than 100 dB, or as specified in the detailed specification	0,5 GHz ~3 GHz
Phase stability vs temperature <sup>c</sup>	7.2.13	≤...PPM (parts per million) Frequency: ...GHz Test temperature:	
Phase stability vs bending <sup>c</sup>	7.2.14	±...° (...GHz to ...GHz) Mandrel diameter: ...mm	
Phase difference <sup>b</sup>	7.2.15	±...° or (...±...)° Sample length: (...±...) mm Frequency: ...GHz	
Corona extinction voltage <sup>b</sup>	7.2.16	≥... kV	
RF power <sup>b</sup>	7.2.17	... W Frequency: ...GHz	

[9] Parameter	[10] IEC 61196- 8:2023 Subclause	[11] Value	[12] Remarks
<b>Environmental characteristics</b>	7.3		
Cold bend performance	7.3.1	No cracks, flaws or other damage in the cable surface	Test temperature: ...°C ±...°C Mandrel diameter: ...mm
Resistance to soldering	7.3.2	Displacement: ≤ ...mm	Bending radius: ...mm
Ageing <sup>b</sup>	7.3.3	Displacement: ≤ ...mm No cracks, flaws or other damage in the cable surface	Length of sample: ...m Test temperature: ...°C ±...°C Duration: 168 h
Stress-crack resistance <sup>d</sup>	7.3.4	No cracks, flaws or other damage in the cable surface	Mandrel diameter: ...mm
Thermal shock <sup>b</sup>	7.3.5	a) Displacement of the dielectric: ≤...mm b) No cracks, flaws or other damage in the cable surface	Length of sample: ...m Low temperature: ...°C ±...°C High temperature: ...°C ±...°C Duration time: see IEC 61196-10:2022, Annex B or as specified in the detail specification. Cycles: 5 or as specified in the detail specification.
Damp heat (steady state) <sup>b</sup>	7.3.6	No cracks, flaws or other damage in the cable surface	Length of sample: ...m Test temperature: ...°C ±...°C Relative humidity: ...% RH ±...% RH Duration time: ... h or ... days
<b>Mechanical characteristics</b>	7.4		
Visual examination	7.4.1	No cracks, splits, irregularities, and imbedded foreign material in the sheath No black spots or cracking in the outer conductor	
Dimensional examination	7.4.2	The requirement shall be specified in the detailed specification.	
Ovality of dielectric	7.4.3	≤ ...%	
Eccentricity of dielectric	7.4.4	≤ ...%	
Ovality of sheath <sup>a</sup>	7.4.5	≤ ...%	
Adhesion of dielectric	7.4.6	≥...N to ≤ ...N	Test temperature: 20 °C ± 5 °C Sample length: $L = 50$ mm
Bending	7.4.7	a) Impedance: ...Ω ±...Ω b) No physical damage in cable surface	Procedure: Bending radius: ... mm
Repeated bending	7.4.8	a) Impedance: ...Ω ±...Ω b) No physical damage in cable surface	Number of cycles: Mass of the weight: ...kg Bending radius: ... mm
Tensile strength of cable (longitudinal pull) <sup>b</sup>	7.4.9	a) Impedance: ...Ω ±...Ω b) No physical damage in cable surface	The maximum tension applied shall be greater than the cable weight of 100 m or be specified in the detail specification.

[9] Parameter	[10] IEC 61196-8:2023 Subclause	[11] Value	[12] Remarks
Pinhole of the finished cable	7.4.10	≤ 10 pinholes per meter, and no pinholes larger than 0,2 mm in diameter.	
Tensile strength and elongation (for cable with sheath) <sup>a b</sup>	7.4.11	Before ageing: Tensile strength: ≥...MPa Elongation: ≥...% After ageing: Tensile strength: ≥...MPa Elongation: ≥...%	Ageing temperature: ... °C ±... °C Duration:168 h
<b>Fire performance requirement</b>	7.5		
Vertical flame propagation for a single insulated wire or cable <sup>b e</sup>	7.5.1	The distance between the upper carbonization point and the lower edge of the upper support is greater than 50 mm, and the distance between the lower carbonization point and the lower edge of the upper support is no greater than 540 mm or is specified in the detail specification.	
Vertical flame spread of vertically-mounted bunched wires or cables — Category C <sup>b d</sup>	7.5.2	The maximum extent of the charred portion measured on the sample shall not have reached a height exceeding 2,5 m above the bottom edge of the burner.	
<sup>a</sup> Applicable to cable with sheath. <sup>b</sup> When required. <sup>c</sup> When applicable. <sup>d</sup> Applicable to cable with FEP sheath. <sup>e</sup> Applicable to cable with LSZH sheath.			



INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

3, rue de Varembé  
PO Box 131  
CH-1211 Geneva 20  
Switzerland

Tel: + 41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)